R E P O R T R E S U M E S

ED 018 087 EF 001 486

PLANNING THE SCHOOL AUDITORIUM, NO. 15.
STATE UNIV. OF N.Y., ALBANY
REPORT NUMBER I-256-AP64-1000(49379) PUB DATE APP 64
NEW YORK STATE EDUCATION DEPT., ALBANY
EDRS PRICE MF-$0.25 HC-$0.72 16P.

DESCRIPTORS- #AUDITORIUMS, #EQUIPMENT, #LIGHTING, #PHYSICAL DESIGN NEEDS, #SPATIAL RELATIONSHIP,

THIS PAMPHLET IS WRITTEN TO ASSIST THOSE WHO ARE CONFRONTED WITH MAKING AUDITORIUM FACILITIES HIGHLY FUNCTIONAL FOR BOTH SCHOOL AND COMMUNITY. AREAS DISCUSSED ARE--(1) LOCATION, (2) VESTIBULE, (3) LOBBY, (4) SEATING CAPACITY AND ARRANGEMENT, (5) BALCONY, (6) ORCHESTRA SPACE, (7) FORESTAGE, (8) PROSCENIUM ARCH, (9) STAGE, AND (10) STAGE EQUIPME[redacted] INCLUDED ARE SECTIONS ON--(1) AUDITORIUM LIGHTING, (2) STAGE LIGHTING, (3) DRESSING ROOMS, (4) STORAGE FACILITIES, AND (5) PROJECTION. COMBINATION GYMNASIUM-AUDITORIUM UNIT AND CAFETERIA-AUDITORIUM UNIT ARE ALSO DEALT WITH. FUNCTIONAL PLANNING OF THE AUDITORIUM IS MOST IMPORTANT IF MAXIMUM EFFECTIVENESS IS TO BE SECURED IN ITS OPERATION AND USE. (RK)

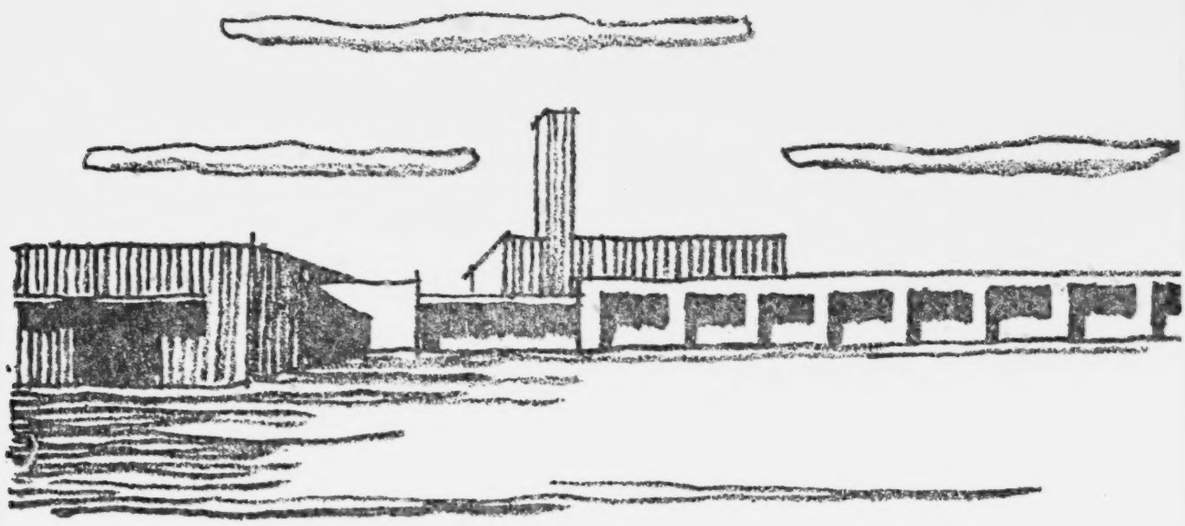
THE UNIVERSITY OF THE STATE OF NEW YORK
THE STATE EDUCATION DEPARTMENT
DIVISION OF EDUCATIONAL FACILITIES PLANNING
ALBANY, NEW YORK 12224

ED018087

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

Planning the School Auditorium



EF001486

I 256-Ap64-1000(49379)*

DIVISION OF EDUCATIONAL FACILITIES PLANNING

April 1948
Reprinted July 1952
Reprinted with slight revision January 1955
Reprinted April 1964

PLANNING THE SCHOOL AUDITORIUM

As the educational program is being broadened and deepened constantly to bring about not only the academic and vocational development of the child, but his social, civic and moral development as well, the auditorium plays an increasingly important part. In a well-administered school it is not uncommon to find the auditorium being used throughout the school day for assemblies, dramatic productions, speech classes, orchestra, band and chorus rehearsals, class meetings, visual education presentations, broadcasting and radio classes and other miscellaneous group activities.

In addition to the daytime use of the auditorium by the school, many communities use this feature of the school building for adult amateur and professional theatrical work, public forums, mass meetings, concerts, motion pictures and radio programs. This is particularly true in those communities where there is no theater, but where cultural and educational activities are desired both for children and adults.

Functional planning of the auditorium is most important if maximum effectiveness is to be secured in its operation and use. This pamphlet is being written to assist those who are confronted with making the auditorium facilities highly functional for both school and community.

Location

The school auditorium should be located on the first floor. This location provides greater safety, expedites the easy flow of traffic to and from the auditorium and generally allows greater economy in construction. It also enables the community to use it independently of the classroom portion of the building.

The auditorium should be planned as a center around which are grouped those units of associated activities and frequent community use. Such an arrangement often makes possible a common lobby for the gymnasium and the auditorium as well as joint usage of other essential facilities. It is especially desirable that the gymnasium, the cafeteria and the music suite be located near the auditorium.

Vestibule

A vestibule leading to the auditorium lobby is desirable as it will assist in controlling drafts and outside noises. If the lobby is narrow, these conditions are better controlled if the vestibule is not directly opposite the main entrance to the auditorium.

Lobby

The lobby should be of sufficient size to accommodate comfortably the number of persons that normally may gather there prior to being seated. An oversized and ornate lobby adds unnecessarily to the building cost and should be avoided. It is deemed wiser to spend the money on the facilities of the auditorium itself.

A small ticket office, heated, and not exceeding 24 square feet in area, should open off the lobby and should be so located that the ticket line will not obstruct entrance to either the lobby or auditorium. In smaller schools it may be feasible to use an adjoining classroom or office as a ticket booth.

Toilet facilities should be provided for those attending auditorium community functions. Such toilets should be so located that no large portion of the school building need be open for their use. In case pupil toilet rooms are not readily convenient for this purpose, it is recommended that public toilet facilities be provided adjacent to the lobby. If the school toilets are used by the public, scrupulous care should be taken to see that after every community affair the toilets are thoroughly cleaned and made ready for school use the following day.

At least one drinking fountain should be located in the lobby, if there is no school corridor fountain conveniently available.

For check room facilities a classroom near the auditorium may be used to advantage. If this plan is followed such classroom should be included in the auditorium heating zone.

A display case in the auditorium lobby is often desired for the exhibition of pupils' classwork. A recess in the side wall of the auditorium lobby is most adaptable for such a case.

A public telephone booth should be provided in the school auditorium lobby, for the convenience of those in the audience. In order that incoming calls may be received and handled promptly, a connecting bell with the public telephone may be placed in the ticket office. Thus any member of the audience may be reached in case of an emergency.

Seating Capacity

The size of the modern school auditorium depends primarily upon two factors: (1) the potential school enrolment and (2) the extent to which the auditorium will be used both by the school and by the community which the school ordinarily serves.

In the average school of this State serving the pupils of kindergarten through grade 12, it is recommended that the minimum number

of seats in the auditorium be not less than the maximum expected enrolment of the kindergarten through grade 6, or that of grade 7 through 12, whichever is larger.

In many New York State communities, the only auditorium facilities available for community presentations of the various local music groups, dramatic clubs, and visiting artists and lecturers are found in the school building. A thorough study of the potential community demands upon the school auditorium should be made before the seating capacity of the unit is finally determined. If this study indicates that the required seating capacity for community audiences will be consistently larger than those of the school alone, there appears to be valid reason for increasing this capacity to accommodate the average community audience. If this is done, increasing public interest in education and the school may be engendered through the opportunity for greater community use of the school building.

Seating Arrangement

The placement of seats, the number of seats, the number and width of aisles and other matters involving safety should be guided by the Building Exits Code of the National Fire Protection Association.

A center aisle generally should be avoided because the center of the auditorium provides the best seating space.

In an auditorium with fewer than 27 rows or four blocks of seats on the main floor, it is good practice to extend the seats to the rear wall, eliminating any cross aisle at the rear of the seats. Cross traffic is then handled through the lobby.

Aisles in a school auditorium should be surfaced with some nonslip material.

It is recommended that the distance measured horizontally from back to back of the auditorium seats be not less than 32 inches.

Balcony

It is not advisable to build a balcony in a school auditorium unless it is desired to increase the seating capacity beyond that number which can be accommodated effectively on the main floor. Experience indicates that 700 to 800 persons can be seated comfortably on the main floor of a school auditorium. Beyond that capacity, the construction of a balcony will eliminate the necessity of having some seats so far removed from the stage that there is difficulty in hearing and seeing well.

The horseshoe-shaped balcony has long been considered inadvisable as the side seats do not give a good view of the stage and such construction often creates poor acoustics under any portion of it. Also the comparatively small number of additional seats secured does not warrant the added expense of construction.

Orchestra Space

An orchestra pit is not recommended for the school auditorium because it interferes seriously with the wider use of this space in front of the stage. If there is no pit this space can be used for additional chairs for events not requiring an orchestra, and conversely the space can be enlarged by the removal of one or more rows of the permanent seats if an especially large orchestra is required.

It has been recommended in the pamphlet, Planning the Music Suite, that the space between the front of the stage and first row of auditorium seats be from 12 feet to 16 feet at the deepest point. Because of the use of this space by music groups, it is important to remember the necessity for the provision of adequate lighting, as recommended in this same pamphlet.

Forestage

The forestage or apron is that portion of the stage which extends into the auditorium in front of the main curtain. The suggested minimum size of the forestage is from 5 feet to 8 feet in depth. For the customary use of the forestage, it is recommended that the curvature be slight.

The front part of any school auditorium stage is used largely for speakers, recitals, panels, forums, and debates. These activities may be carried on in front of the main curtain on the forestage without interfering with preparations for other activities to take place on the stage proper. It is possible to eliminate the forestage entirely in order to allow more space for auditorium seating. If such a plan is used the functions ordinarily performed on the forestage may be carried on in front of the olio curtain.

It is desirable frequently to get to the forestage directly from the auditorium without going backstage. This may be accomplished by extending the apron beyond the proscenium opening and building in steps at each end of the forestage. Steps may be built leading from the auditorium to a three-way platform (an extension of the forestage or apron) from which one may proceed to the forestage, to the backstage, or to an exit from the auditorium, either to the corridor or out-of-doors.

Every school auditorium should have at least one corridor accessible to the offstage or backstage area. This corridor floor should be at the same level as the stage floor to facilitate easy movement of stage properties and to establish better conditions of safety.

The desirable height of the forestage and the adjoining stage is from 3 to 3½ feet. A height greater than this causes considerable discomfort for those watching a performance from the first rows of seats, due to the unnatural but necessary tilt of the head.

Proscenium Arch

The proscenium arch, usually a rectangular opening, should be not less than 26 feet in width in the average school auditorium seating 400 or more, and in no case should it be less than one-half the width of the auditorium. A greater width in the proscenium arch than 32 feet can be justified only when the auditorium is so wide that the sight lines from the extreme front outside seats to the playing area of the stage would be obstructed otherwise by the proscenium wall. In any case, the objective should be to have not more than one-sixth of the playing area of the stage excluded from the view of the extreme outside auditorium seats.

The proscenium arch, in most cases, should be not less than 14 feet in height and should always be high enough to provide good sight lines from all seats in the house. The teaser, a masking border, suspended from a batten just behind the front curtain, may be raised or lowered to adjust the height of the stage opening.

Stage

It is imperative that a school stage be accessible from at least one corridor without passing through the auditorium proper.

The school auditorium stage will be used not only for dramatic presentations but for concerts, recitals, forums, motion pictures, lectures, etc. It is generally recognized, however, that a stage properly planned for the production of plays will be entirely adequate for the other purposes for which it will be used.

Usually the size and the dimensions of the stage depend upon the size of the auditorium. There are certain minimum requirements for any stage, however, that are necessary to provide for the program of the average school housing children of the kindergarten through the 12th grade. For example, effective use of the stage can not be secured if the backstage and offstage areas are limited in size.

The minimum depth recommended for the stage of the average school is 25 feet behind the front traveling curtain. With the already suggested minimum depth of 5 feet for the forestage, the entire stage

will have a total minimum depth at the center of 30 feet, if a forestage is constructed. Stages of less than 25 feet in depth are proving to be inadequate for the modern educational program.

The space offstage is most frequently the area that is reduced far below the basic needs. The width of this space on each side of the stage should equal at least one-half the width of the proscenium arch. In those cases where it seems expedient to provide an extremely large proscenium opening, a minimum width of 12 feet to 15 feet offstage space on each side is recommended. This amount of space is particularly necessary where there is no loft or stage house in which to "fly" scenery. Most schools will be unable to provide a loft above the stage floor because of the expense of such construction; therefore, some temporary storage space to enable quick change of scenery will be necessary offstage. Many schools have provided for this by building vertical racks on the back corners. Sometimes these racks are constructed of metal piping, adequate to hold several pieces of scenery.

A corner of the offstage space may be used for the storage of the stage grand piano. Storage of properties etc. offstage should be held to a minimum, however, for otherwise there will be interference with the free movement of persons during the necessary backstage and offstage activities of any performance. In this connection, it is recommended that stage radiators be installed either on the floor in recessed openings or on the walls about 7 feet above the stage floor. There must be room for some lighting equipment, a few properties, working space around the lighting panel and space to accommodate large groups of people, especially at times of group concerts, recitals, or other activities. This suggestion emphasizes the importance of not cutting up offstage space with steps, stairways, hallways, etc.

The height of the space above the stage floor is usually governed by the height of the auditorium itself unless a loft is constructed. In no case, however, should the ceiling of the stage be less than 8 feet above the top of the proscenium arch. A loft should be built only in those schools and communities where there is considerable interest in dramatics and where the community needs are sufficient to warrant this additional expenditure.

The beams over the stage should be left exposed in order to provide the opportunity to instal stage equipment without difficulty. Where there is reason for casing the overhead steel beams, eye bolts welded to these beams should be placed before the ceiling over the stage is plastered or finished.

The stage floor should be of long-grained softwood to enable nailing supports for scenery to the floor, thus insuring full use of the

stage for dramatic productions. Some schools have used hardwood flooring on the forestage or the area in front of the first traveling curtain. After the stage floor has been varnished or sealed, it is difficult for the audience to distinguish between the hardwood and the softwood flooring.

Storage of scenery and equipment in space underneath the stage, accessible by means of a trap door in the stage floor, is not recommended. The cost of excavating for such space is usually excessive, the handling of materials between stage and storage space is difficult, and this arrangement creates a definite fire hazard that should be avoided.

Two duplex stage floor pockets for electric outlets should be installed at each end of the playing area of the stage. These along with wall plugs, recommended for installation on the back wall of the stage, should provide adequately for any necessary supply of electricity.

Wide doorways through which properties, musical instruments and stage equipment may be moved onto the stage should be provided. Double doors opening directly out-of-doors make it possible to bring in stage equipment from the outside without moving it through the building.

Stage Equipment

A gridiron over the school stage is not customary unless there is a loft. In those school auditoriums without the gridiron there is considerable valid opinion in favor of steel construction and piping for overhead equipment support. In some cases where there is a small amount of scenery raised and lowered by means of a counterweight system, pulleys may be fastened to the overhead steel beams if the latter are left exposed. Also, in case it is desired to plaster the ceiling over the stage, thus covering the overhead steel beams, several planks may be bolted to the overhead beams parallel to the front of the stage and spaced several feet apart to provide a suitable place for installation of stage equipment. These planks should be slightly longer than the width of the proscenium opening.

A counterweight system for placement of scenery is now used almost universally on all stages. In connection with this system there is a locking rail called a pin rail which is installed preferably offstage on the right side, as one faces the auditorium, either on the stage floor or on an adjoining mezzanine. It is recommended that the pin rail be installed in the adjoining righthand mezzanine if there is sufficient height above the stage floor to permit efficient operation of

the counterweight system with this arrangement. If it becomes necessary to instal the pin rail on the floor, it should be located so as to avoid cutting up the offstage space.

The average school stage equipment should include the front curtain, valance and track system, and the cyclorama setting, which preferably should have a plain rear curtain, two side curtains, the necessary borders and headers. This setting may have a track system for the rear curtain or be mounted entirely on pipe battens. It is advisable to use separate battens for the side curtains rather than one continuous semicircular pipe batten. Some schools will also desire the olio setting which is composed of the olio curtain with grand drapery border, tormentors, tabs and track system for the curtain. There is always the need for an exterior drop which is placed in back of the cyclorama curtain usually not less than 3 feet from the wall. This amount of equipment is considered necessary for presentations of the usual type.

Fireproof or flameproof curtains, draperies and furnishings are an essential requirement in the school auditorium. There is some opinion that light gray or taupe is the best color for the stage curtains as this color can be modified effectively in tone by the stage lighting. With the flameproof accessories, care should be taken to see that they are re-treated following cleaning. If a regular dry cleaning program is standard procedure, it is likely that the flameproof treatment after each processing will ensure protection for the interval between cleanings. The effective life of flameproofing treatments varies with respect to the nature and the thoroughness of the treatment.

Considerable progress has been made in the use of woven glass fabrics for auditorium draperies and stage curtains. It is suggested that such fabrics be considered for future auditorium installation since they provide a high degree of safety. All such auditorium equipment should be safe, practical, efficient, economical and easily maintained.

Auditorium Lighting

Flexibility in auditorium lighting is important because of the different types of functions held in a school auditorium. For example, dimming the house lights often adds to the effectiveness of a performance.

Inasmuch as the stage and the forepart of the auditorium are used during school hours much more than the entire auditorium, it is important that the lights across the front of the auditorium may be used without turning on all the house lights.

Double electric outlets should be provided near the floor on the back and side walls of the auditorium and the stage front. The outlets on the stage front near the floor, placed about 4 feet apart, are necessary for the music rack lights used by the orchestra. It is also advisable to have a floor plug about midway between the front and the back of the auditorium. With these convenience outlets, utilization of any portable projection equipment as well as the operation of any essential electric cleaning apparatus will be possible.

To provide for proper safety when the auditorium is in darkness, it is recommended that aisle lights be installed on the side of the aisle seats at every third row on the main floor and every two rows in the balcony. Exit lights are required.

It is recommended that a switch controlling a small auditorium pilot light be installed in the lobby, so that a person may see to get backstage to the large switchboard from the rear of the auditorium when the house lights are not on.

Stage Lighting

Good stage lighting is essential to the success of any production, and the lighting instruments and the control board which produce it are very important stage equipment. Stage lighting equipment includes footlights, border lights, floodlights, strip lights, cyclorama lights and spotlights. All of these determine the intensity, the color, and the distribution of light on the stage and each type of light has its own function. The exact number of lights can be recommended only after a careful study of the individual stage and the type and character of productions to be presented.

There has been considerable discussion concerning the use of footlights and there seems to be no complete agreement among theater specialists as to their value. There is a definite trend, however, toward the elimination of footlights in the school stage as well as the theater stage. If footlights are installed they should be of the disappearing, concealed type.

There are many times when there will be a need for extra light on the forestage or apron; consequently, consideration should be given to the installation of two or three large spotlights in the auditorium ceiling in front of the proscenium arch. If a balcony is constructed in the school auditorium, these lights can be located along the balcony front. These spotlights should be remote-controlled, and equipped with a four-color screen, preferably red, amber, blue and white. Planking for this type of light will avoid later temporary and unsightly spotting of such lighting equipment at various points in the auditorium.

Border lights and large spotlights are basic in providing for the general illumination of the stage. Baby spotlights, strip lights, floodlights and cyclorama lights may be installed at any time, and the only consideration at the time of building is to provide a sufficient number of electric outlets and circuits of ample capacity to provide for them.

The recommended location for the lighting panel is on the stage side of the proscenium wall approximately 4 feet from the proscenium opening either recessed at the floor level or raised about 10 feet above the stage floor. If the panel is elevated it is necessary to provide a platform with guard rail around the control board. Because of the modern tendency to inclose settings consideration should be given to locating the control board so that the operator can get a full view of the stage. In a school auditorium this might be accomplished by locating the lighting panel in the projection booth but this entails considerable expensive wiring and the expense does not seem justified for the average school stage.

The continued improvement being made in control boards makes it important to study the various kinds and types before any final selection is made. If a thyraton control panel, much more compact than the resistance type, is installed, it should be located preferably at the center of the stage front. This location is ideal, as it gives the operator the opportunity to observe the stage from the point of view of the audience. This type of control panel may be installed so as to be concealed except when it is in use.

The wiring of a school auditorium should be thoroughly studied to be sure that there are enough circuits, sufficient and properly placed circuit outlets, and wiring of the proper gage to carry any load of the occasional performance which may require extensive stage lighting. Too many schools have found after the building is completed and in use that the wiring is not heavy enough for the presentation of community productions.

In order to provide a greater degree of safety for those entering the stage directly from a corridor or adjoining hallway, it is recommended that an electric light with convenient switch be located near the door. This will simplify locating the auditorium lighting panel.

Dressing Rooms

In the average school, stage dressing rooms are not needed. The absence of such facilities, however, necessitates the use of classrooms or some large unit which is near the stage for dressing rooms.

If an adjoining room is to be used as a dressing room, it is advisable to equip such a classroom or unit with hot and cold water.

In large schools where separate dressing facilities are to be provided, it is suggested that a room no smaller than a standard classroom be constructed immediately accessible to the stage for such purposes. In a room of this size there is sufficient space along one wall for make-up tables, lights, mirrors and other equipment for a number of persons.

Folding screens are often used in this type of room to establish small private places for changing clothes.

Since proper lighting is very desirable for make-up work, it is recommended that side lights and lights over all mirrors be provided. Lighting for this purpose can be furnished with portable equipment if it is desired to save expense of permanent installation.

Toilet facilities should always be near the stage and when special dressing rooms are provided it is advisable to instal adjoining toilet rooms.

Storage Facilities

It is essential that a storage room within reasonable distance of the auditorium stage be provided for extra stage scenery, properties used for productions, lighting equipment, risers used for music concerts, extra chairs and miscellaneous auditorium and stage equipment. The size of such a room depends upon (1) the extent of the dramatic, music and speech program in the school and (2) the community demand for the stage facilities.

General Considerations

Because of the infrequent use made of auditorium windows it is becoming increasingly common to eliminate them entirely. Such design does away with the necessity for expensive darkening shades, imperative where windows are provided, and makes the heating of the auditorium more economical.

Proper ventilation is of vital importance to any school auditorium. Since there is great variation in the design of auditoriums, it is necessary to bring expert engineering into the design of each ventilation system. There must be adequate air changes to remove odors and excess heat, and these changes must take place without disturbing noises or drafts.

Since so much use is now made of sound equipment and public address systems, it is recommended that openings be provided on each side of the proscenium arch approximately 2 feet square for the installation of auditorium speakers. These concealed and inconspicuous places for the speakers should be covered by grille-cloth material which will not affect the sound; the speakers should be properly

insulated against outside interference. These openings are purposely made this size in order to be large enough to accommodate any speaker installation that a school may desire at the time of building or later. Such a provision will avoid the necessity of always placing portable speakers with the accompanying connecting wire in some noticeable place in front of the auditorium. Speaker plug outlets in the floor of the stage should be provided for connecting these speakers to a stage microphone or other such equipment.

A school auditorium should be equipped with a clock in some portion of the house. Various locations have been tried, and from careful study and experience, it seems advisable to place the clock near the front and on the side wall of the auditorium. This location enables both a speaker and the audience to determine the time without noticeable inconvenience.

Inasmuch as the acoustical treatment of the auditorium is so vital to the effective use of the unit, it is recommended that a specialist in the field of acoustics be consulted.

A back rail placed at the rear of the seats on the main floor is unnecessary as there are few occasions when it is useful. A solid back rail is used often to prevent drafts from the lobby. Proper planning as previously recommended will eliminate this trouble.

Projection

Naturally any projection booth should be located at the rear of the auditorium. It may be advantageously placed in the balcony and in the absence of a balcony, off an upper or lower corridor, depending upon the particular building planned.

If 35-mm film is to be exhibited, it is necessary to comply with the regulations of the fire underwriters for nitrocellulose motion picture film. The projection apparatus should be inclosed in a fire-resistive fixed booth in accordance with the standards of the National Fire Protection Association for nitrocellulose motion picture film.

It is believed that 16-mm projection serves most effectively the needs of the average school. In order to eliminate machine noise reaching the audience, the 16-mm projection should be done from a booth or a recessed area off the corridor, adjacent to the rear of the auditorium.

It is important to realize that a projection booth for 16-mm projection may be as small as 4 feet x 8 feet with a 7-foot ceiling. No matter what the size of the booth, it should be properly ventilated. Care should be exercised to see that the floor of the booth is sufficiently high to accomplish projection without interference with vision by members of the audience even when standing. If the projection

booth is to be used for the storage of films it is suggested that it be made large enough to house a film splicer and a film cleaning machine.

A booth which is to be used as the location of spotlights for stage lighting as well as for projection should have an adequate number of openings. Some schools have found it advisable to insert glass in all projection and observation openings thus preventing much noise in the booth from reaching the audience. In some cases one opening, approximately 3 feet long and 1 foot high, has been provided. This large aperture permits 16-mm projection, allows the use of spotlights from the booth, if it is not too far removed from the stage, and makes possible the observation of the entire stage.

To establish a check on the volume of the sound being delivered to the audience a monitor speaker should be placed in the projection booth. There should be also a master switch to enable the operator of the projection equipment to control all the house lights. If the booth is to be utilized for the location of spotlights for stage lighting, it is advisable to have telephone communication from the booth to backstage. Electric outlets should be provided in the booth for the operation of all necessary electric equipment.

A standard speaker plug should be built in at the point or points from which it is expected to project (whether in a booth or not), and wired to the front of the auditorium and/or to the permanent speakers. This eliminates speaker cords running from the projection equipment along the auditorium floor to the speakers.

It is recognized that good projection is accomplished when (1) the nearest members of the audience are no closer to the screen than approximately twice the width of the image on the screen, (2) the farthest spectators are no more distant from the screen than six times the width of the image on the screen and (3) the screen is so located on the stage as to conform with these two fundamental rules and at the same time provision is made for the utilization of the maximum number of front side seats without interference of the sight lines by the proscenium wall.

Combination Gymnasium-Auditorium Unit

It should be said at the outset that the gymnasium-auditorium does not meet the educational needs of a complete school and community program as effectively as the separate and individual units.[1] In some small central schools, however, the combination unit has served reasonably well.

[1] Those planning to build a combination gymnasium-auditorium not only should be guided by the recommendations for the auditorium given in this pamphlet but should read also the pamphlet, Planning the Indoor Physical Education Facilities for Central Schools.

The proscenium opening of the stage along the side of a combination gymnasium-auditorium necessarily is wider than that which is ordinarily recommended for an auditorium because of the shape of this unit. The width of the opening should be such that sight lines from a *majority* of the side seats are not obstructed. A danger which may arise as a result of the increased width of the proscenium opening is the reduction in the offstage space. It is important to meet the minimum of 12 feet to 15 feet offstage space on each side, even in the combination unit.

In the combination gymnasium-auditorium the forestage should not be built as such construction would interfere with the carrying on of the physical education program.

When it becomes a necessity to construct a combination gymnasium-auditorium, it must be remembered that it is inadvisable to attempt to make the gymnasium appear like an auditorium. In other words, costly draperies and decorative features in the gymnasium should be omitted as they are subject to rapid deterioration because of the gymnasium activities. It is considered unwise to construct ornate decorations around the proscenium opening of the stage of a gymnasium-auditorium. Essentially, any such combination unit is first a gymnasium and secondly an auditorium.

Combination Cafeteria-Auditorium Unit

There is another combination which is regarded favorably, particularly where economy of space is a necessity. This is the combined cafeteria-auditorium unit and is often called a cafetorium or an auditeria.

It has a flat floor. One of the main advantages of this type of unit is that it is rarely necessary to clear the floor completely of tables and chairs.

Used for approximately two hours as a cafeteria, the rest of the school day it is available for other purposes. Since it is a relatively large area, it is adaptable for accommodating large groups such as assembly, orchestra, band, choral groups and community meetings.

This type of cafeteria-auditorium area has been constructed in many elementary schools and in a few secondary schools.